invention include a wetlaid nonwoven fabric layer formed of discrete length thermoplastic polymer fibers and a spunbond nonwoven fabric layer formed of continuous thermoplastic polymer filaments.

Claims 1-14, 16-18, 20-22, 24 and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Shinjou et al. U.S. Patent No. 4,795,559. Shinjou describes a composite filtration support that includes a low density carded fiber layer bonded to a high density wetlaid web. It should be noted that this reference is mentioned in the background portion of Applicant's specification (page 3, line 5) as being representative of a prior art type of composite membrane support. The present invention represents an improvement over this prior type of membrane support.

In the Official Action, the Examiner states that Shinjou teaches a composite support for a semipermeable membrane having a spunbonded nonwoven fabric first layer of continuous polyester fibers and a nonwoven second layer of discrete length polyester fibers. The Examiner acknowledges that the layer of discrete fibers is not wetlaid, but is drylaid or carded. However, the Examiner contends that this does not represent a difference in product structure. Applicant respectfully traverses the Examiner's rejection.

With respect to the spunbond nonwoven fabric first layer claimed by Applicant, the Examiner contends that this structure is shown in the Shinjou reference by the high density meltblown layer described at Col. 4, lines 1-3. Applicant respectfully disagrees. A spunbond nonwoven fabric is distinctly different in structure from a meltblown nonwoven fabric. They are produced by two distinctly different nonwoven manufacturing technologies. Spunbond fabrics are produced by extruding continuous filaments of molten polymer from a spinneret, cooling and attenuating the filaments, depositing the filaments onto a collection surface such as a moving belt in a random uniform manner, followed by bonding the filaments to form a coherent, strong nonwoven fabric. Meltblown technology uses an entirely different apparatus and produces a distinctly different type of nonwoven fabric. In the meltblowing process, molten polymer is extruded from orifices in a meltblowing die, whereupon high velocity air or other fluid impinges upon the molten polymer, causing the polymer streams to be attenuated and to form microfibers. The solidified microfibers are then deposited on a collection surface to form a nonwoven web.

These two nonwoven technologies are recognized in the art as being distinct and different. To illustrate this point, enclosed as Exhibit A is a syllabus from a course entitled "Nonwovens Science and Technology II" taught by Professor Larry C. Wadsworth at the University of Tennessee Knoxville. Under the section entitled "Formation of Nonwovens", five different nonwoven technologies are described including drylaid nonwovens, wetlaid nonwovens, meltblown technology and spunbond technology and nanofiber nonwovens. At Exhibit B is a copy of the section describing spunbond technology. At Exhibit C is a copy of the section entitled "Meltblown Technology". The syllabus outline and the content of Exhibits B and C make it clear that spunbond technology and meltblown technology are recognized as two different and distinct technologies and that they produce distinctly different kinds of nonwoven fabrics.

From the foregoing, it should be evident that the description in Shinjou at Col. 4, lines 1-3 of a meltblown layer does not anticipate the spunbond nonwoven fabric first layer described in Claim 1.

As for the wetlaid nonwoven fabric second layer claimed by Applicant, the Examiner recognizes that this is not shown in the Shinjou patent. However, the Examiner contends that the terms "wetlaid" and "drylaid" relate only to process differences and do not define differences in product structure. This position is without any proper factual basis. Reconsideration by the Examiner is requested.

Referring again to Exhibit A, it will be seen that drylaid nonwovens and wetlaid nonwovens are treated as distinctly separate subjects in the syllabus. Enclosed as Exhibit D is a copy of the section entitled "Drylaid Nonwovens, and enclosed as Exhibit E is the section entitled "Wetlaid Nonwovens". From the descriptions given in these two sections, it is evident that not only do the terms "wetlaid" and "drylaid" refer to different manufacturing processes, but also, that the resulting nonwoven fabrics have distinctly different structural characteristics. For example, at page 6 of the wetlaid nonwovens article, the structural differences between wetlaid and drylaid nonwovens are discussed. Wetlaid nonwovens typically are formed from shorter fibers and the web structure is closer, stiffer and less strong than in comparable webs made from the longer fibers used in dry processes.

For the foregoing reasons, it should be evident that the term "a wetlaid nonwoven fabric" is an art recognized term that defines not only the method by which the fabric is made, but also characterizes the fabric in terms of its structure. Therefore, the recitation in Claim 1 of a "wetlaid nonwoven fabric" is not anticipated by the Shinjou description of a drylaid carded nonwoven fabric.

As for obviousness, the rejection as stated has failed to establish a *prime facie* case of obviousness. In particular, as noted above, the meltblown layer described by Shinjou is different from the spunbond nonwoven fabric first layer claimed by applicant. The carded (drylaid) staple fiber layer of Shinjou is also quite different from the wetlaid nonwoven fabric second layer claimed by applicant. The Shinjou reference thus fails to teach or suggest all of the limitations set forth in Claim 1. The rejection also provides no explanation why it would be obvious to modify the structures of the respective layers in the Shinjou reference to arrive at the combination of layers claimed by applicant. The rejection fails to establish either a motivation for modifying the Shinjou teachings, nor an explanation why there would be a reasonable expectation of success. Furthermore, from the explanation given earlier and from the accompanying Exhibits, it should be evident that the differences between the first and second layers claimed by Applicant and the layers described by Shinjou are so significant that the claimed combination of layers would not have been obvious from the Shinjou description.

In summary, the rejection of independent Claims 1, 17 and 21 as being anticipated by or obvious from Shinjou is clearly improper. The claims dependent from these independent claims likewise are neither anticipated nor obvious from the cited prior art. Reconsideration by the Examiner and withdrawal of this rejection are respectfully solicited.

As a further deficiency in the Examiner's rationale, it should be noted that according to Shinjou, it is the low density layer that is produced by airlaying or carding and the high density that is produced either as a wetlaid web or as a meltblown layer. In the rejection, the Examiner proposes to substitute a meltblown layer for Applicant's claimed spunbond layer and a carded layer for Applicant's claimed wetlaid layer. Following this rationale would result in reversing the location of the low density layer and high density layer relative to the location of the membrane that is applied to the support. Claim 21, for example, calls for the semipermeable

membrane to be adhered to the second outer surface of the support, which is a wetlaid nonwoven fabric. Following the rationale used in the rejection, the semipermeable membrane or porous polymer layer would be adhered to the spunbond layer rather than to the wetlaid layer. For these additional reasons, Claims 21-26 are neither anticipated nor rendered obvious by the Shinjou reference.

Claims 19 and 23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Shinjou reference. The Examiner states that Claims 19 and 23 add the further limitation of the binder being present in the spunbond layer as well. The Examiner contends that Shinjou teaches the spunbonded polyester layer as being self bonded but does not say if the layer has fibers of different melting points. The Examiner maintains that the claims are deemed unpatentable unless the Applicant can come forward with evidence showing that the binder makes an unobvious structural difference in the product.

The Examiner has failed to establish a *prima facie* case of obviousness with respect to Claims 19 and 23. It is only after the Examiner has satisfied the burden of demonstrating a *prima facie* case of obviousness that the patent applicant must come forward with proof demonstrating the patentability over the prior art. In the present case, it is submitted that the requirements for establishing a *prima facie* case of obviousness have not been satisfied. In particular, it is clearly established that the prior art references must teach or suggest all of the claim limitations. Also, there must be a reasonable expectation of success. Additionally, the Examiner must show some motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference to arrive at the claimed invention.

In the present instance, Claims 19 and 23 recite structure that is nowhere taught or suggested in Shinjou. Specifically, Claim 19 specifies that the spunbond nonwoven fabric first layer is formed of matrix filaments of a polyester homopolymer and binder filaments of a lower melting polyester copolymer. It further recites that the wetlaid nonwoven fabric second layer is formed of matrix fibers of a polyester homopolymer and binder fibers of a lower melting polyester copolymer. Shinjou does not teach or suggest using two different compositions, namely a polyester homopolymer and a polyester copolymer in the low density layer. Nor does

he teach or suggest using these two compositions in the high density layer. Therefore, it is clear that the reference does not meet all of the limitations of the claim and that a *prima facie* case of obviousness has therefore not been established. Furthermore, the rejection fails to articulate a motivation for modifying the Shinjou structure in order to arrive at the structure defined by Claims 19 and 23.

Claims 15 and 25 have been rejected under 35 U.S.C. § 103 as being unpatentable over Shinjou further in view of Cadotte et al. U.S. Patent No. 4,765,897. The Examiner notes that Shinjou teaches a polymeric membrane over the support layer but does not specify a porous polymer layer on the support and then the semipermeable membrane adhered to the porous polymer layer. For this aspect, the Examiner relies upon Cadotte, Col. 3, lines 1-37. The Examiner contends that it would have been obvious to use the support taught by Shinjou for making the reverse osmosis membrane taught by Cadotte.

This rejection inherents the fundamental deficiencies articulated above with respect to Claim 1 and the claims dependent therefrom. Accordingly, this rejection is improper and should be withdrawn.

In view of the foregoing comments, it is submitted that Claims 1-26 patentably distinguish Applicant's invention over the cited prior art. Reconsideration by the Examiner and formal notification the allowability of all claims are earnestly solicited.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, on July 28, 2005.

Janet F. Sherrill